Evaluation of Skin Cancer Risk Factors and Sun Protection Methods among Medical Faculty Students

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ABSTRACT

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Purpose: It was aimed to evaluate the sun protection methods and skin cancer risk factors among medical students.

Materials and Methods: The universe of the descriptive research is 1,2,3,4,5 and 6th grade students (1482 students) of the medical faculty of a state university. It was aimed to reach the whole universe, no sample size was calculated. The questionnaire was delivered via WhatsApp in November-December 2021. Sociodemographic information, skin cancer risk factors, sun protection methods were questioned (38 questions). The behaviors of sun protection methods were evaluated by scoring the questions (6 questions). Higher score indicates higher protection behavior. Median, minimum, maximum values, numbers (n) and percentages (%) were used for descriptive data. The Mann Whitney U test was used to compare the quantitative variables that did not fit the normal distribution. The significance level was considered as $p < 0.05$.

Results: Of the participants 58.3% (n=354) were women, 25.2% (n=153) were sixth grade. Of the students 34.9% (n=212) use sunscreen, 32.3% (n=196) use a hat, 39.9% (n=242) use sunglasses only in summer. Of the students 48.9% (n=297) had Fitzpatrick skin type 3, 20.3% (n=484) reported having more than 50 nevi, 37.2% (n=226) reported having nevi larger than 2 mm. Female students, students educating in upper classes and living in coastal areas, having Type 1-2-3 skin types and freckles had higher sun protection behavior scores (p<0.05).

Conclusions: The rate of medical faculty students paying attention to sun protection methods is not sufficient. Awareness on this issue should be increased.

Keywords: Sun protection, skin cancer, medical students

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INTRODUCTION

Climate change has become an increasing problem worldwide. With the increasing climate change, people have started to be exposed to harmful sunlight more. As a result of the changes in the ozone layer and the atmosphere, the effect of this exposure become greater [1-3].

Istanbul located in Turkey, which hosts the Asian and European continents, has a transition climate between the Black Sea and the Mediterranean, and is one of the cities that receive the most precipitation in the Marmara Region [4]. Acording to a measurement period between 1950 – 2022; the lowest temperature in the city is -9 °C and the highest temperature is +40 °C throughout the year, and the average relative humidity is 75%. Data of the Ministry of Environment, Urbanization and Climate Change, General Directorate of Meteorology reports that average annual sunbathing time in Istanbul (hours) is 1.0 [5].

The incidence of melanoma and non-melanoma skin cancers has been increasing in recent years. 2 to 3 million non-melanoma skin cancers and 132,000 melanoma skin cancers occur each year, worldwide [6]. According to the data of World Health Organization (WHO)-The Global Cancer Observatory; the number of new cases of melanoma skin cancers in 2020 was 1.756 in Turkey [7]. In a single-centered study conducted with 7396 people admitted to the dermatology clinic in Turkey, the frequency of skin cancer was reported to be 2.7% (basal cell cancer 1.2%, squamous cell cancer 1.1%, malignant melanoma 0.4%) [8]. Although everyone is at risk of developing skin cancer, individuals with fair skin, with many large nevi and spots, exposed to sunlight for a long time, and had a history of sunburn in childhood are at higher risk of developing skin cancer [9-11].

The skin types of people are important for risk assessment of skin cancer. The Fitzpatrick skin classification is a tool created by Thomas Fitzpatrick (1988) to classify the skin types [12]. The risk status is determined by evaluating the skin color of the person and the changes in the skin when exposed to sunlight. According to this classification; Type 1 skin: Pale white skin color, blue or green eye color, blond or red hair color, always burns in the sun, does not tan, Type 2: Fair skin, blue eyes, burns easily in the sun, hardly tans, Type 3: Wheat skin , burns first and then tans when exposed to the sun, Type 4: Light brown tan, burns little in the sun, tans easily, Type 5: Brown skin color, does not burn in the sun, tans very easily, Type 6: Dark brown or black skin color, never does not burn, always tans [13]. While the risk of the skin cancer is highest in type 1 and type 2 skin types; the lowest risk is seen in type 5 and type 6 [6].

In studies conducted in the literature, it has been shown that the harmful effects of the sun are not known correctly; and attitudes and behaviors towards sun protection are insufficient [14,15]. Skin cancer is one of the important health problems associated with the environmental factors such as exposure to sunlight. For this reason, avoiding exposure to sunlight and using protective measures against the negative effects of sunlight should be at the top of the measures to be taken against skin cancer [16]. It will be possible to observe the positive effects of interventions to increase the level of knowledge of people about skin cancer risk factors and methods of protection against skin cancer in terms of behavior change [17]. With the interventions and trainings, it should be aimed to increase the level of knowledge and awareness on this subject; so people can be aware of their own skin, regularly monitor it and have dermatological examinations. This is extremely important for the prevention of the harmful effects of sunlights and the early diagnosis of skin cancer [17,18].

There is limited number of studies conducted in Turkey among university students for the evaluation of the knowledge about skin cancers and the sun protection methods. According to these studies, the attitudes and behaviors of students about sun protection were not sufficient [15,19]. In a study conducted in Turkey, 37.9% of the students had knowledge about skin cancer [19]. In other words, more than half of the students lack knowledge about skin cancers.

In the literature, it has been stated that preventive behaviors acquired at an early age have a positive effect in order to prevent skin cancer [10, 20]. Health professionals also have great responsibilities in increasing this awareness. As future physicians, medical faculty students are role models for other individuals with their life behaviors. Besides, they are in an early age period, so they can better see the benefits of the protective life behaviors. In this context, our aim in this study is to evaluate the sun-protective behaviors of medical faculty students of an university in Istanbul. In addition, it was aimed to evaluate the skin cancer risk factors of the students.

MATERIALS AND METHODS

Study design, type, population and sample

This is a descriptive type of study. A questionnaire was applied to evaluate the methods of protection from sunlights, skin cancer risk factors and sociodemographic variables of 1st, 2nd, 3rd, 4th, 5th and 6th grade students of a state university in Istanbul, Turkey. Data were collected through the WhatsApp application via mobile phones during November-December 2021. At the beginning of the questionnaires, there was an information letter about the study and a consent box for their participation. After giving consent, students answered the questionnaire. The confidentiality of the data was ensured.

The universe of the study was 1.-6. grade medical faculty students of a state university in Istanbul. There were 1482 students in total (1. to 6. grade: 250, 255, 236, 265, 261, 215, respectively). It was aimed to reach all the students of relevant medical faculty. Therefore, sample size was not calculated. In the study, a total of 607 students were reached, including 153 students from 6. grade, 104 students from 5. grade, 63 students from 4. grade, 102 students from 3. grade, 98 students from 2. grade, and 87 students from 1. grade (41.0% of the total population).

Measures

Our questionnaire consists of 38 questions totally. The first part of the questionnaire consists of sociodemographic questions (6 questions). In the second part, the skin cancer risk factors of the participants (such as skin types, number of nevi) and their protection methods against the sunlight (such as the use of hats, sunglasses, sunscreen) were questioned. Studies in the literature were used in the preparation of these questions [1-3,9]. The behaviors of protection methods were evaluated by scoring of the questions about using sun protection methods (6 questions). For the non use of sunscreen, sunglasses and hats (each separately) 0 point was given, for using only during holidays 1 point, for using in summer 2 points, and for using in all seasons 3 points were given. For non-users of sunscreen cream 0 point was given, 1 point for use with sun protection factor (SPF) 15 factor, 2 and 3 points for use SPF 30 factor and SPF 30≥ factors, respectively. 0 point for non-renewal of sunscreen, 1 point for renewing sunscreen was given. 0 point was given for those who went out to the sun between 10 a.m. and 4 p.m., and 1 point was given for those who did not. The total score of these 6 questions was calculated. A higher score was defined as a higher protection behavior against sunlight.

Statistical evaluation

SPSS (Statistical Package for Social Sciences) for Windows 25.0 program was used for statistical analysis and data recording. In the study, median, minimum and maximum values, numbers (n) and percentages (%) were used for descriptive data. Conformity of continuous variables to normal distribution was examined by visual (histogram and probability charts) and analytical methods (Kolmo-gorov-Smirnov/Shapiro-Wilk tests). The Mann Whitney U test was used to compare the two groups for data that did not fit the normal distribution. Statistical significance level was accepted as $p<0.05$ in all analyzes.

Ethics committee approval and permissions

Ethics committee approval was obtained from the Clinical Research Ethics Committee of the relevant university with the protocol number 09.2021.1104 on 08.10.2021 for the conduct of the study. Permission was obtained from the medical faculty of the relevant university on 06.11.2021 to conduct the study.

RESULTS

Of the participants 58.3% (n=354) were female. While the median age was 22 years, the minimum and the maximum ages were 18 and 30 years, respectively. Of the participants 25.2% (n=153) were sixth grade students. In addition, 84.5% (n=512) of them live in the Marmara Region, 59.3% (n=360) spent most of their lives in the metropolitan area. The monthly income of 45.8% (n=278) of the students was between 1000 and 3000 TL (Turkish Lira) (Table 1).

It was observed that the majority of the participants (48.9% , n=297) had Fitzpatrick Skin Type 3 (Wheat skin color, first burns and then tans when exposed to the sun). The percentage of participants with type 1 skin type was 4.6% (n=28), the percentages of participants with type 2, type 4, type 5 and type 6 skin types were 14.7% (n=89), 21.4% (n=130), 9.2% (n=56), 1.2% (n=7) respectively. Of the participants 13.2% (n=80) reported having freckles, 20.3% (n=484) had more than 50 nevi, 37.2% (n=226) had nevi larger than 2mm. Of the participants 16.3% (n=99) noticed an increase or change in the number of nevi in the last 6 months. Of the participants 46.5% (n=282) made self examination of their nevi, 18.8% (n=114) of them control their nevi once a month, 12.2% (n=74) less than once a month and 15.5% (n=94) check it once a year. The percentage of participants who visited to any doctor for a nevus examination before was 11.5% (n=70). The percentages of family history of cancer and skin cancer were 38.1% (n=231) and 3.8% (n=23), respectively (Table 2).

When the sun protection behaviors of the participants were evaluated, 34.9% (n=212) of them use sunscreen only in summer. Of the sunscreen users 27.1% (n=130) do not renew their sunscreen during the day, and 62.1% (n=377) use SPF>30 sunscreen. Of the participants 32.3% (n=196) use a hat, and 39.9% (n=242) use sunglasses only in summer. Of the participants 85.0% (n=516) go out to the sun between 10 a.m. and 4 p.m.. The percentages of students who never use a hat and sunglasses were 45.5% and 33.8%, respectively (Table 3).

The factors associated with the participants' sun protection methods were examined. Students in higher grades, living in the Marmara/Aegean/ Mediterranean/Black Sea Regions, having Type 1/Type2/Type 3 skin type, having freckles, and females had statistically significantly higher behaviour scores of sun protection methods (p<0.05). There was no significant difference between the number of nevi, having a nevi larger than 2 mm, an increase in the number of nevi in the

last 6 months, a family history of a cancer, a family history of skin cancer, and the behavior scores of individuals regarding sun protection method (p>0.05) (Table 4).

Table 1. Sociodemographics information of the participants

		n	%
Gender	Male	253	41.7
	Female	354	58.3
Living Area	Marmara Region	513	84.5
	Aegean Region	13	2.1
	Black Sea region	14	2.3
	The Mediterranean region	28	4.6
	Central Anatolia Region	14	2.3
	Eastern Anatolia Region	9	1.5
	Southeast Anatolia Region	16	2.6
Type of Settlement*	Village	13	2.1
	Town	24	4.0
	City	210	34.6
	Big city	360	59.3
Monthly Income (TL)**	<1000	99	16.3
	1000- <3000	278	45.8
	3000- <5000	90	14.8
	>5000	128	21.1
Class	1.	87	14.3
	2.	98	16.1
	3.	102	16.8
	4.	63	10.4
	5.	104	17.1
	6.	153	25.2

* Settlement in which most of their life was spent, **TL:Turkish Lira

Table 2. Characteristics and behaviors of participants associated with skin cancer risk

Characteristics of the participants		n	%
Skin type	Type 1	28	4.6
	Type 2	89	14.7
	Type 3	297	48.9
	Type 4	130	21.4
	Type 5	56	9.2
	Type 6	7	1.2
Presences of freckles	Yes	80	13.2
	No	527	86.8
Nevus number more than 50 nevi	Yes	123	20.3
	No	484	79.7
Having nevus bigger >2 mm	Yes	226	37.2
	No	381	62.8
Increase or change in the number of nevi in the last six months	Yes	99	16.3
	No	508	83.7
Self controlling of nevi	Yes	282	46.5
	No	325	53.5
Frequency of "self controlling of nevi"	Rarer	74	12.2
	once per month	114	18.8
	once per year	94	15.5
Applying to a doctor for a nevus examination	Yes	70	11.5
	No	537	88.5
Family history of cancer	Yes	231	38.1
	No	376	61.9
Family history of skin cancer	Yes	23	3.8
	No	584	96.2

Table 3. Behaviors of participants using sun protection methods

Sun Protection Methods		n	%
Sunscreen cream	Summer	212	34.9
	Every season	136	22.4
	Only on holidays	132	21.7
	Never	127	20.9
Sunscreen cream factor	No use	131	21.6
	SPF* 15	14	2.3
	SPF 30	85	14.0
	SPF>30	377	62.1
Renewal of sunscreen cream	Yes	130	27.1
	No	350	72.9
Hat	Summer	196	32.3
	Every season	55	9.1
	Only on holidays	80	13.2
	Never	276	45.5
Sunglasses	Summer	242	39.9
	Every season	122	20.1
	Only on holidays	38	6.3
	Never	205	33.8
Sun exposure from 10 a.m. to 4 p.m.	Yes	516	85.0
	No	91	15.0

*SPF: Sun protection factor

Table 4. Factors associated with participants' sun protection methods behaviors

		BEHAVIOR SCORES			P value
		Median	Min.	Max.	
Gender	Male	5.00	0.00	13.00	**<0.001**
	Female	8.00	0.00	13.00	
Class	1., 2., 3.grade	6.00	0.00	13.00	**<0.001**
	4., 5., 6. grade	8.00	0.00	13.00	
Living area	Coastal regions*	7.00	0.00	13.00	**<0.001**
	Other*	4.00	0.00	11.00	
Skin type	Type 1/ Type 2/ Type3	7.00	0.00	13.00	**0.032**
	Type 4/ Type 5/ Type 6	6.00	0.00	13.00	
Presences of freckles	Yes	8.00	0.00	13.00	**<0.001**
	No	7.00	0.00	13.00	
Nevus number	<50	7.00	0.00	13.00	0.252
	>50	7.00	0.00	13.00	
Having nevus bigger >2 mm	Yes	7.00	0.00	13.00	0.682
	No	7.00	0.00	13.00	
Increase or change in the number of nevi in the last six months	Yes	8.00	0.00	13.00	0.635
	No	7.00	0.00	13.00	
Family history of cancer	Yes	7.00	0.00	13.00	0.404
	No	7.00	0.00	13.00	
Family history of skin cancer	Yes	6.00	0.00	12.00	0.127
	No	7.00	0.00	13.00	

Coastal regions: Marmara/Aegean/Mediterranean/Black Sea Regions, other regions: Central Anatolia/East Anatolia/Southeast Anatolia Region

When admissions to the hospital for nevus examination were evaluated, 17.1% (n=21) of those with more than 50 nevus had undergone a nevus examination before, while 10.1% (n=49) of those with less than 50 nevus number applied to a physician for a nevus examination. Students having nevi larger than 2 mm applied to a nevus examination with a higher percentage than those

without (19.5% vs 6.8%) (p<0.001). The percentage of admission to nevus examination was significantly higher in students experienced an increase in the number of nevi or a change in the shape of nevi in the last 6 months (21.2% vs 9.6%) (p=0.001) (Table 5).

Table 5. Factors related with nevus examination

		Nevus Examination				P value
		Yes		No		
		n	%	n	%	
Nevus number	<50	49	10.1	435	89.9	0.031
	>50	21	17.1	102	82.9	
Having nevus bigger than >2 mm	Yes	44	19.5	182	80.5	<0.001
	No	26	6.8	355	93.2	
Increase or change in the number of nevi*	Yes	21	21.2	78	78.8	0.001
	No	49	9.6	459	90.4	

*In the past 6 months

DISCUSSION

There are many studies in different populations that measure the use of sun protection methods and the level of knowledge about the risk factors of skin cancer. In our study, the relationship between the habits of using sun protection methods and their skin cancer risk factors in medical school students was evaluated.

According to the data in our research, the percentage of participants who never use the sunscreen was 20.9%, and the percentage of those using the sunscreen was determined as 79.1%. Similar to our results, in a study conducted by Castilho et al. among university students, the percentage of participants using sunscreen was found to be 83.9% [21]. In addition, in a study conducted by Saridi et al. among high school students, it was determined that the percentage of sunscreen usage was low, and that about half of the participants using sunscreen did not use it with an appropriate SPF [22]. The non-use of sunscreen by students may be due to low awereness and knowledge about skin cancers. Also other causes such as cost, may also cause to non-use of sunscreens [19]. While raising students' awareness of skin cancer prevention methods, practical solutions can be produced to increase their access to protective methods.

Other methods of sun-protection are the use of hats and sunglasses. In one study, 69.3% of university students never wear a hat when going out. In the same study, 15.3% never wear sunglasses [19]. Similarly, the percentages of those who did not use hats and sunglasses as a sun protection method was found to be high in our study (45.5% and 33.8%). Our results and the literature indicate that protective behaviors of university students agaisnt skin cancer are not sufficient. Qualitative studies are needed for the better understanding of the reasons for not using sun- protective methods.

According to the results of the study, female participants had higher sun protection methods behavior scores than male participants. Female participants engage in more sun protection behavior. In the study of Balcı et al., the rate of using sunscreen cream was found to be approximately twice as high in women as in men (54.4% vs 24.2%) [16]. Another study stated, female students of a medical faculty use sunscreen cream more frequently [23]. In the study of Yurtseven et al., 58.7% of men and 87.5% of women wore sunglasses; 86.2% of men and 48.0% of women use hats [24]. In addition, according to a descriptive study conducted by Uslu et al. on Adnan Menderes University physicians in 2006, female participants use sun protection methods more frequently than male participants [2]. These differences between the genders may be due to the fact that the health responsibility of women is higher than that of men, as stated in the literature [25].

When the skin types of the participants in our study were classified according to the Fitzpatrick skin types groups, the groups whose skin type was more sensitive to the sun developed more sun protection behavior. In the study of Falk et al., it was found that individuals with high skin UV sensitivity took more protective measures such as using sunscreen cream, staying in the shade, and wearing sun protective clothes [26]. It can be thought that individuals with sun-sensitive skin types apply more protective measures, since they are adversely affected by the sunlights, apart from its cancer-causing effect.

In our study, the sun protection method behaviors of the students in the clinical period were higher than those in the preclinical period. It is an expected situation that students' awareness and knowledge about skin cancer and prevention methods will increase in the clinical period when contact with the patients and education in the hospital begins. Similarly, in a study, the knowledge level of first-year and last-year medical students

about skin cancer, and their protection against sun were evaluated. A higher level of knowledge was observed in the last grades than in the first grades [27]. The general health knowledge of the medical faculty students in the clinical period may also increase as health workers. The increase in the level of knowledge and protective behaviors in higher grades suggests that education on skin cancer may be beneficial, especially for students studying in the first grades. Courses that will increase both the awareness and knowledge about skin cancer should be added to the education curriculum of the university students. According to our study, the sun protection method behaviors of students who spent most of their lives in coastal areas were higher. In the literature, the level of knowledge about skin cancer and sun protection of students living in the Mediterranean region was higher than that of students living in other regions [28]. In another study conducted with university students in Turkey; the sun protection behavior scores of the students living in the Mediterranean region were found to be higher than those of the students living in the Black Sea region [29]. It can be interpreted that students living in these regions are exposed to more sunlight due to climate and weather conditions, and therefore they may use more protection methods. There is a need for interventions to increase the level of knowledge and awareness about skin cancer also in individuals who do not live in sunny areas.

It is extremely important to check the number and shape of nevus on the body for the early diagnosis of a possible skin cancer. Nearly half of the our participants made self examination of their nevi. In a similar study conducted with university students, more than a third of the students checked their nevus [30]. In our study, those with more nevi on their bodies, those with nevi larger than 2 mm in their body, and those with changes in size or shape in their body in the last 6 months applied to nevus examination more frequently. In the study of Uslu et al., it was determined that only 47% of the participants with abnormally shaped and sized nevi went to the physician for a nevus examination [2]. In our study, only 21.2% of the students who observed a change or enlargement in their nevus reported that they consulted a doctor for a nevus examination. In our study and in the literature; the percentages of both self-examination and the physician examination for nevus are low. Especially for individuals with a high risk for skin cancer, follow-up examinations will be life-saving in terms of early diagnosis of a possible cancer. Creating this awareness in medical school students, who are the physicians of the future, will also increase the awareness of the society on this issue.

Limitations and strengths of the study

The inability to use a validated scale on students' skin cancer and sun protection methods causes limitations for the interpretation of the study results. Another limitation of our study is that the questions evaluating risk factors such as the number of nevi and the change in the shape of the nevus are based on statements. This situation may have limited the objectivity of the answers given to the questions. The low participation rate of 41.0% creates a limitation in terms of the generalizability of the study results. In the study, the evaluation of both skin cancer risk factors and sun protection method behaviors in medical school students, who are future physicians, is one of the strengths of the study. We believe that with the questionnaire applied within the scope of the study, we have created an awareness in students about skin cancer and prevention methods. This is another strenght of the study.

CONCLUSIONS

Within the scope of the study, the avoidance of sun exposure and skin cancer risk factors of medical students were examined. Students in higher grades, living in the Marmara/Aegean/Mediterranean/Black Sea Regions, having Type 1/Type2/Type 3 skin type, having freckles and females statistically significantly higher behaviour scores in terms of sun protection. It is known that exposure to sunlight can cause skin cancer. Thus, it is important to raise awareness in the society in order to reduce the modifiable risk factors. Physicians have an important role in this awareness. In our study, the percentage of paying attention to these methods was insufficient among medical faculty students. The level of awareness among physicians can be increased by emphasizing this more in medical faculty.

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Conflicts of interest
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